

### REMARKS

Claims 1-50 were presented for examination. Claims 1, 2, 4-34, 36-39, 45, 46 and 48-51 are pending and are rejected. Reconsideration is respectfully requested.

#### The Notice of Appeal

On July 26, 2010, the applicant appealed to the Board of Patent Appeals and Interferences from the decision of the Examiner, dated March 26, 2010, rejecting claims 1, 2, 4-34, 36-39, 45, 46 and 48-51. The filing of the attached RCE and this submission hereby removes the appeal.

#### The Affidavit filed on September 29, 2009

The examiner argues that the affidavit filed on September 29, 2009 is ineffective to overcome *Cespedes et al.* because (i) the submitted paper does not teach a wave-based imaging method comprising directing energy waves radially, receiving radial scattered energy waves and processing the received waves to map angular location and frequency parameters to construct images of objects and (ii) a timeline of due diligence to reduction to practice has not been provided.

37 CFR § 1.131 provides that when any claim of an application is rejected, the inventor of the subject matter of the rejected claim may submit an oath or declaration to establish invention of the subject matter of the rejected claim prior to the effective date of the reference on which the rejection is based. It is sufficient to show conception of the

invention prior to the effective date of the reference coupled with due diligence from prior to said date to a subsequent filing of the application.

A Declaration of the undersigned is attached and is incorporated herein by reference and shows that the inventor of the present invention conceived the subject matter of the rejected claims prior to the effective date of the reference. The inventor, Dr. Sean Lehman, has provided a paper dated December 2, 2010, which shows the location in his paper dated January 4, 2001, of teachings that are sufficient to enable one skilled in the art to practice the claimed invention. In the 2010 paper, footnote 1 shows that the term "Intravascular" implies imaging from within a blood vessel, i.e., an interspace. Footnote 2 shows that "diffraction tomography" is implicitly wave-based. Footnote 3 shows that IVUS operates by rotating an ultrasonic head. At each angular location, as the head rotates, it emits a field and collects the back-scattered energy. Footnote 4 shows that the term "back-scattered" implies reflection mode and reflected fields. Footnote 5 shows that the term "rotating" implies multiple angular locations. Footnote 6 shows that the term "wide-band" implies multiple frequencies. Footnote 7 shows that the term "frequency diversity" implies multiple frequencies. Footnote 8 shows that the term "multimonostatic" implies multiple spatial locations. Footnote 9 shows that the term "pulse" implies multiple frequencies. Footnote 10 shows the term "reconstructed" implies imaging. Footnote 11 shows that the images are a function of radius,  $r'$ , and angle,  $\theta$ . Accordingly, the paper shows conception of a wave-based imaging method as recited in claims 1, 16 and 22 and shows a wave-based imaging apparatus as recited in claims 30 and 45.

Due diligence from prior to the reference date to the subsequent filing of the application was carried out. Cespedes et al. claims priority to U.S. Application 10/127,052, which was filed on April 19, 2002. The present application claims priority to U.S. Provisional application 60/474,861, filed May 30 2003. Therefore the applicant must show diligence from prior to April 19, 2002 to May 30, 2003, which is the filing date of the present application. The attached declaration of the undersigned provides evidence of due diligence. A timeline showing diligence is as follows.

The invention was conceived by Dr. Lehman at least as early as January 4, 2007 as shown in the attached document titled "Radial Reflection Diffraction Tomography for Intravascular Imaging."

The inventor submitted an invention disclosure on June 1, 2001 as shown in the attached Record of Invention.

A classification review was initiated on June 6, 2001 as shown in the attached letter to William Fritchie

An analysis of the invention disclosure was made to determine patentability, marketability export control, U.S. preference/competitiveness, adverse affects on defense activities of the U.S. Note that numerous invention disclosures are under review simultaneously. After completion of the invention review, the REGENTS sent the attached letter dated September 12, 2002 to DOE, electing to retain title to the invention.

As shown in the attached letter dated September 12, 2002, a request was made to the LLNL Laboratory Counsel that a patent application be prepared and filed.

As shown in the attached letter dated October 15, 2002 from DOE to LLNL, DOE approved the request for election to retain title.

A request for a provisional application was made to the Laboratory Counsel, as shown in the email dated May 12, 2003.

Approval of the classification review was provided as shown on the attached letter on May 29, 2003

A provisional application was filed on May 30, 2003, as shown on the attached Express Mail Certificate and the attached extensive specification bearing the USPTO application number stamp. The specification includes the paper relied upon by the applicant to show prior conception. It provides additional documents as well.

The nonprovisional application was filed on March 30, 2004, as shown on the attached Certificate of Mailing bearing that date.

Therefore, the applicant has shown due diligence from prior to the reference to a constructive reduction to practice.

#### The 35 U.S.C. § 102 Rejections

Claims 1, 4-12, 14, 16, 17, 19-22, 24-30, 32-43 and 36-39 are rejected as being anticipated by Cespedes et al. The rejection is respectfully traversed.

In each independent claim (1, 16, 22 and 30), the applicant's processing step includes the application of a wave-based algorithm that can map an angular location. As shown in the attached Declaration, incorporated herein by reference, and paper titled "Radial Reflection Diffraction Tomography for Intravascular Imaging," dated

January 4, 2001, incorporated herein by reference, and the annotated paper dated December 2, 2010, the inventor conceived the subject matter claimed in the above referenced patent application prior to the earliest possible effective filing date (April 19, 2002) of U.S. Patent Application Publication No.: 2003/0199767 A1 (Cespedes et al.). Therefore, the reference should be removed and the rejection of claim 1, 4-12, 14, 16, 17, 19-22, 24-30, 32-43 and 36-39 should be withdrawn.

#### The 35 U.S.C. § 103 Rejections

Claims 2, 18, 23, 31, 45, 46 and 48-51 are rejected as being unpatentable over Cespedes et al. The rejection is respectfully traversed.

As discussed above, the rejections of claims 1, 16, 22 and 30. The rejection of claim 2 should be withdrawn because it depends from claim 1. The rejection of claim 18 should be withdrawn because it depends from claim 16. The rejection of claim 23 should be withdrawn because it depends from claim 22. The rejection of claim 31 should be withdrawn because it depends from claim 30. The rejection of claim 45 should be withdrawn because the reference should be removed as discussed above. The rejection of claims 46 and 48-51 should be withdrawn because they depend from claim 45.

Claims 13 and 15 are rejected as being unpatentable over Cespedes et al. in view of Zhdanov et al. The rejection is respectfully traversed.

The rejection of claims 13 and 15 should be withdrawn because they depend from claim 1. Therefore the rejection should be withdrawn.

### Conclusions

It is submitted that this application is in condition for allowance based on claims 1, 2, 4-34, 36-39, 45, 46 and 48-51 in view of the attached Declaration, the attached documents and the foregoing comments.

If any impediments remain to prompt allowance of the case, please contact the undersigned at 925-292-4777.

Respectfully submitted,

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Dated: December 27, 2010